

AVOIDING COMMON PREHOSPITAL ERRORS

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DON'T ASSUME THE PULSE OXIMETER IS PERFECT!

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Oxygen saturation is frequently referred to as the "5th vital sign" in the growing list of what prehospital providers measure and assess in their course of patient care. Pulse oximeters are ubiquitous, and while the O_2 saturation measurements are very useful, these machines have limitations, and thus, there are important pitfalls to avoid. Good decisions based on the "pulse ox" reading come from an understanding of how an oximeter functions and what the reading indicates.

Standard pulse oximeters emit red and infrared light. The frequencies correspond to those absorbed by deoxyhemoglobin (unbound) and oxyhemoglobin (bound with O_2). The oximetry unit measures the relative absorption of the two frequencies of light across the digit and calculates the oxygen saturation. This calculation is based on reference values obtained from a healthy volunteer study; this limits the accuracy and utility of oximetry once a patient's O_2 saturation falls below 70%. There are multiple other factors that can affect the O_2 reading such as abnormal hemoglobins, the presence of nail polish (especially blue, green, and black), hypotension, hypothermia, vasoconstriction, and fluorescent or xenon lamps. It is also important to be able to distinguish an accurate waveform from one that is seen with motion artifact—a common cause of error which can lead to inappropriate patient management.

As mentioned above, abnormal hemoglobin can cause inaccurate pulse oximeter readings. Remember that the machine *calculates* the oxygenation saturation; it doesn't directly measure it, and it does the calculation based on the absorption of red and infrared light. Abnormal hemoglobins absorb similar frequencies of light, which can lead to falsely high- or low-oxygen saturation readings that can lead a prehospital care provider down a dangerous path of assuming the patient is less ill than they truly may be. Carboxyhemoglobin absorbs the same frequency as oxyhemoglobin, or "normal" hemoglobin. Thus, carbon monoxide-poisoned patients have falsely elevated oxygen saturation readings when the patient is actually oxygen deprived and hypoxic at the tissue level.

EMS providers must remember that even with high carbon monoxide levels, a normal or near-normal oxygen saturation may be displayed on the monitor.

Methemoglobinemia, a result of abnormal iron oxidation in the heme ring of hemoglobin, absorbs the same frequency as oxy and deoxyhemoglobin and will also cause inaccurate pulse oximetry readings. Many over-the-counter and prescription drugs can predispose a patient to this condition. Methemoglobinemia will cause falsely low pulse oximetry readings (which do not improve with supplemental oxygen administration), which often display around 85% to 88%. This condition is easily treatable if one remembers how pulse oximetry readings interpret and display this condition.

Another significant potential pitfall in the interpretation of O₂ saturation readings is to assume it provides accurate information on patient ventilation status. Oxygen saturation can remain high as ventilation deteriorates and the pCO₂ silently rises, especially in patients who are receiving supplemental oxygen. This is very important to remember with respect to disease processes affecting ventilation but not oxygenation, such as asthma and COPD. Young healthy asthmatics with otherwise normal lungs can progress far into ventilatory failure before their O₂ saturation starts to fall. The falling O₂ saturation is a late occurrence and signals impending respiratory failure.

A final potential pitfall in the use of pulse oximetry is using it to determine a patient's heart rate. It's tempting, but the machines are not designed to perform this assessment accurately. The pulse reading that is performed by the oximeter is only designed to assess if the machine is picking up a pulse accurately enough for the saturation reading to be reliable.

The patient's pulse has to be taken manually; a pulse oximeter is not a substitute.

As an example, in extreme tachycardias there can be variable cardiac output, with the oximeter picking up only every few beats. A reading of 75 might actually be reflecting the real atrial flutter rate of 150 or even 300. In those cases where the pulse oximeter is picking up the same pulse rate as the manual reading, it can be used as a monitor, with changes manually verified.

In conclusion, while pulse oximetry is an incredibly useful tool for patient monitoring, it is important to understand how to appropriately interpret the O₂ saturation in the context of the patient's clinical presentation. Providers must be knowledgeable of oximetry's limitations when assessing a patient needing prehospital provider care and transport.

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**DO NOT INTERRUPT CPR FOR MORE
THAN 10 SECONDS: IT CAN BE THE
DIFFERENCE BETWEEN STAYING ALIVE
AND BITING THE DUST**

JONATHAN WENK, MD

In a landmark study published in the February 2002 edition of the journal *Circulation*, researchers determined that neurologic outcomes of cardiac arrest survivors were improved with continuous chest compressions. It has since been demonstrated that interruptions in chest compressions negatively impact overall mortality and the neurologic outcomes of cardiac arrest survivors. These findings prompted the American Heart Association (AHA) to change its official guidelines in 2010 so that laypeople would provide compression-only cardiopulmonary resuscitation (CPR). Similarly, it is critical for prehospital providers to administer continuous chest compressions for cardiac arrest victims. This is a huge shift from emergency medical services tradition where the importance has always been placed on tracheal intubation, intravenous access, rhythm analysis, and other advanced life support interventions.

The goal behind performing chest compressions is to perfuse end organs with oxygenated blood. The brain is the organ most susceptible to damage from hypoxic events. Therefore, cerebral perfusion pressure must be maintained during cardiac arrest to ensure improved neurologic outcomes. Timerman et al. concluded that uninterrupted chest compressions promoted higher cerebral and coronary perfusion pressures, leading to an overall decrease in mortality and poor neurologic outcomes.

The most common cause of interrupted chest compressions is multiple or prolonged attempts at securing the airway. While ventilating and oxygenating the lungs is important, it is also important to note that cells are able to extract oxygen from any available circulating hemoglobin. This exchange can take place even when partial pressures of oxygen (PaO_2) in arterial blood are extremely low. This finding highlights the importance of providing continuous chest compressions to circulate oxygenated hemoglobin to the cells.

It is now known how frequently CPR is disrupted during the resuscitative sequence. In a landmark paper published in the journal *Circulation* in 2005, Valenzuela et al. determined that frequent and prolonged stops in chest compressions occur in 57% of out-of-hospital nontraumatic cardiac arrests. The authors cite this fact as chiefly responsible for the dismal 7% survival rate for out-of-hospital arrest victims.

If intubation attempts are unsuccessful while chest compressions continue, alternative airway management techniques should be employed. The use of oropharyngeal/nasopharyngeal airway adjuncts, in conjunction with two-person bag-valve-mask ventilation, or the insertion of an extraglottic device (i.e., laryngeal mask airway), or a dual-lumen airway (i.e., easy tube), are all excellent alternatives to tracheal intubation. The bottom line—don't interrupt chest compressions to attempt intubation!

Chest compressions are also sometimes temporarily halted during placement of intravenous catheters. If movement from continuous chest compressions genuinely prevents the prehospital provider from obtaining intravenous access, resuscitation drugs should be administered via the intraosseous route.

Two other common causes of disrupted chest compressions involve the use of defibrillators. Practitioners often stop chest compressions to apply ECG electrodes, defibrillation pads, while charging the defibrillator, and during pulse checks after delivering a shock. Chest compressions should be interrupted only during actual delivery of an electrical shock, and resumed immediately thereafter, for a full 2 minutes.

Rhythm analysis is another common cause of interrupted chest compressions. The cardiac rhythm should be quickly analyzed prior to delivering an electrical shock, or at the end of every 2-minute compression cycle. A prolonged interruption in chest compressions to analyze the cardiac rhythm is an absolute mistake. It is also best practice for prehospital providers to analyze the ECG rhythm while assessing the pulse.

If prehospital personnel become fatigued while performing chest compressions, a replacement provider should take over in a coordinated and choreographed manner to minimize the interruption. In addition, consideration should be given to the use of automated CPR devices. Similarly, physical transfer of cardiac arrest patients from bed to bed should be coordinated and performed as quickly as possible to allow for minimal interruption of chest compressions.

Finally, it is worth mentioning that compressions should be performed at a rate of at least 100 beats/minute. This has been demonstrated to be the ideal rate to circulate oxygenated blood. A slower compression rate will introduce built-in interruptions that should be avoided. Performing chest compressions to the beat of the popular Bee Gees song, "Stayin' Alive," ensures a rate of 100 compressions per minute. Less optimistic providers can listen to Queen's, "Another One Bites the Dust," for the same time signature.

In summary, uninterrupted chest compressions performed at a rate of at least 100 beats/minute has been shown to decrease mortality and improve

neurologic outcomes in survivors of cardiac arrest. Many prehospital defibrillators have a metronome feature to assist providers in determining the ideal chest compression rate. If available, mechanical chest compression devices provide uninterrupted chest compressions at the proper rate and depth. Whether these devices are superior to human chest compressions, however, is controversial.

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PAY CLOSE ATTENTION TO BLS INTERVENTION!

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You are dispatched to a cardiac arrest. Your partner runs for the intubation gear, and the firefighter medics are setting up an intravenous line (IV). With all the paramedic help at the patient's side, there can be no doubt about survival, right? **WRONG!**

ACLS is thought of as the "gold standard" when rendering treatment to victims of cardiac arrest. Recent literature suggests that basic life support is equally, if not more, important and paramedics often overlook this component. In 2005, <6% of out-of-hospital cardiac arrest patients survived to hospital discharge. In that same year, the American Heart Association published two studies that documented poor quality of cardiopulmonary resuscitation (CPR) performed during in-hospital and out-of-hospital resuscitations. Prehospital cardiac arrest has poor survivability; there is no doubt. To increase the survivability, renew your emphasis on good BLS care, specifically CPR.

There are many procedures for patients in cardiac arrest: Chest compressions, endotracheal intubation, venipuncture, medication administration, etc. Of these, compressions may have the highest therapeutic value. Studies have repeatedly shown an increase survival of ventricular fibrillation (VF) patients with early CPR and defibrillation. When CPR is performed properly, you can maintain a cardiac output of 25% to 30% of normal values. This is a vital amount of blood flow necessary to perfuse core organs such as the heart, brain, and lungs. During VF, the patient's heart is depleted of oxygen and energy. Compressions can deliver the oxygen and energy to the heart, increasing the likelihood that a shock will both eliminate VF and be followed by return of spontaneous circulation (ROSC). The current standards reflect a compression rate of at least 100 per minute, a depth of at least 2 in., allowing for adequate recoil, minimizing interruptions, and avoiding excess ventilations. This can be difficult to maintain consistently throughout an entire call. Making an effort to periodically step back and assess the overall quality and focus of patient care can significantly change patient outcome.

Pay special attention to your ventilatory rate. One of the most common pitfalls in BLS care is unintentional hyperventilation. When a patient breathes in normally, the diaphragm flattens and lowers, causing a negative intrathoracic pressure. This pulls air into the lungs and enhances blood

return to the heart. When a patient is ventilated, the diaphragm does not react physiologically and air is forced into the lungs creating a positive pressure. Positive pressure ventilation inhibits blood return to the heart. When hyperventilating our patients, we are actually decreasing cardiac preload and therefore cardiac output.

All too often we take unnecessary or longer than necessary breaks in CPR for intubation, patient movement, or IV's. To maintain cardiac output and optimize patient outcome it is also important to ensure quality compressions throughout the patient encounter, especially while moving the patient into the hospital. It is very difficult to get the proper compression depth, rate, and recoil with the stretcher at its highest height setting. Often, this can be easily accomplished by lowering the stretcher to allow for proper technique. Minimize interruptions in compressions by becoming more efficient. Perform CPR during attempts at intubation and intravenous or intraosseous access. If you must stop, only stop for the bare minimum amount of time to perform the skill. Early defibrillation has shown to be the most significant intervention when treating your patients in VF and pulseless ventricular tachycardia and should be performed as efficiently as possible. Do not stop CPR to place defibrillation electrodes on the patient or charging the defibrillator. Good BLS care continues to be the backbone of cardiac arrest treatment even during the ACLS interventions. Treatments should be performed around consistent and quality CPR to provide the best chance of survival. Cardiac arrest medications will not yield their maximum effect if they are not properly circulated. To allow medications, the best chance at performing, it is best to administer these medications as soon as possible during the 2-minute cycles of CPR. Properly performed CPR will give medications more time to circulate and reach their site of action.

The goal in every resuscitation event is ROSC and discharge from the hospital with intact cardiocerebral function. All too often we overlook and underemphasize the BLS components of cardiac arrest care. Remember to periodically step back and assess quality and focus of patient care. Maintain proper compressions, minimize interruptions, and become a more efficient practitioner when performing interventions. Hyperventilation will reduce cardiac preload and output, so be sure to maintain the proper rate of ventilation throughout patient care. The better BLS care is instituted, the more impact ALS interventions can have.

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TRAUMA TRANSPORT: DON'T FORGET YOU CAN DRIVE

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BACKGROUND

The use of helicopters as air ambulances began during World War II on an extremely limited basis. Helicopters gained popularity during the Vietnam War as a method of rapidly evacuating injured soldiers. The helicopters were staffed with medical personnel so that vigorous resuscitation of the wounded could be started on the battlefield and continued during evacuation. Rapid evacuation and prompt, aggressive resuscitation proved to significantly decrease morbidity and mortality. But does this significance carry over to the civilian world in the US? Has the use of helicopters been shown to reduce mortality?

EVIDENCE

The literature suggests that delaying the transport of *some* critically injured patients is detrimental. Let's face it—helicopter evacuation is cool. It's exciting to brag about "flying one out." Aeromedical evacuation implies that the wreck was *really* bad and the patient was at death's door. The problem is that very few patients benefit from the use of helicopters, yet first-responders continue to call for aviation to evacuate patients with various degrees of injury. It is the duty of the prehospital provider to quickly and objectively evaluate whether or not use of a helicopter will decrease transport time and improve the patient's outcome.

R Adams Cowley introduced the concept of the Golden Hour in the late 1970s. He noticed a decrease in mortality in patients who reached the operating room nearest the time of injury. The concept of the Golden Hour seems logical; however, data does not support the theory for all patients. Data does show that rapid transport and helicopter evacuation actually only benefits a very small number of patients.

It is important to clearly identify the trauma patient for whom rapid transport is critical. It turns out that this patient is somewhere in the middle of the spectrum of injury severity. If injuries are minor, transport time can be delayed without life-threatening consequences. On the other hand, injuries may be so severe that even surgical intervention would be futile. For the group in the middle, helicopter emergency medical services (HEMS) can

actually make a difference. But this difference does not come from sitting on the scene to immobilize the patient or place an intravenous catheter; we intervene solely by shortening the interval between injury and the operating room. When EMS activates and waits on the scene for a helicopter, the patient is in a holding pattern.

There is often no true timesaving when utilizing helicopters. Moreover, in cases where helicopter evacuation does reduce overall transport time, there is no appreciable change in patient outcome. Data suggests that helicopters are an efficient means of transport if the distance from the scene to the operating room exceeds 60 miles. Otherwise, the clear choice is ground transportation. Another study suggests that HEMS should be considered when the scene is more than 45 miles from the receiving hospital.

EMS has a tendency to significantly over-triage trauma patients and inappropriately utilizes HEMS. A significant percentage of patients transported by helicopter have only minor injuries, and many are not even admitted to the hospital. In an urban area with a sophisticated prehospital system, researchers found no survival advantage for patients transported by helicopter. Although it is accepted practice to over-triage trauma patients, providers often overlook the dangers and costs associated with helicopter evacuation.

There are countless stories of well-intentioned field providers utilizing a helicopter to evacuate a critically injured trauma patient, only to have that patient arrive at the hospital by air AFTER a less injured patient arrived by ground.

BEST PRACTICE/CONSIDERATIONS

There is a small group of patients who may benefit from the use of HEMS. Will your patient benefit from the skills of the helicopter crew or the service of the helicopter?

Helicopters are expensive and risky; EMS crews rarely consider this, but the risk to benefit ratio should in fact be in the forefront of our minds when deciding upon aeromedical evacuation.

HEMS is virtually never appropriate for use in an urban or suburban setting when the receiving hospital is in close proximity to the incident. HEMS may serve a role in the rural setting, but more data is required to inform this decision.

Short on-scene times (OST) are important for critically ill patients. The use of a helicopter increases OST by approximately 30%. Remember that the next time you are faced with a decision about HEMS, ground transportation may be the best option.

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DON'T WAIT FOR THE HELICOPTER! PITFALLS IN AVIATION SELECTION

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INTRODUCTION

An essential skill of an EMS provider, especially at the advanced life support (ALS) level, is to recognize a critical complaint in addition to signs of a potentially unstable patient. The last chapter discussed the importance of accurate triage of the critically ill or injured to the closest "appropriate" facility, specifically the correct specialty center. In considering the utilization of scene air medical evacuation, a common problem is that while most EMS providers are able to correctly identify a sick patient quickly, calling for an air resource may not constitute the ideal mode of transportation on the basis of the logistics, location, and medical presentation. Medics may be led into a "knee jerk" reaction to seek aircraft activation for any triage decision toward specialty care. The reasons for this may be the widespread availability and/or marketing of air services, or the tradition in some EMS systems that establish the specialty centers as better accessible by air. Simply put, no equation should exist that automatically marries specialty center triage to air medical activation. If that occurs indiscriminately, patients will be "waiting" for helicopters for significant periods of time.

AIR MEDICAL PATIENT SELECTION: WHEN WAITING FOR AN AVIATION RESPONSE IS MOST BENEFICIAL

Summoning aviation assets is usually associated with a delay in response by definition, because on average services are spread out and coming from distances much greater than the local EMS agency. Therefore, careful thought should be given to weigh the benefits of waiting for an aircraft against the risks of that delay and even of flight. Reasonable criteria for summoning the aircraft might include:

- Acute trauma with physiologic criteria or other time critical emergencies were discussed in Chapter 85.
- Inaccessible locations for feasible land evacuation to a specialty center in a reasonable time frame; very large distances to cover, very remote locations, island emergencies, or poor topography might all be examples of situations where the air asset activation clinically benefits patients.
- Entrapment that creates the opportunity for aircraft to be immediately in place after rescue.

- Special rescue situations could represent very sound reasons for utilization.

GUIDING PRINCIPLES IN CONSIDERING ACTIVATION

Recall that the assignment of aeromedical resources is a medical decision separate and distinct from the initial triage process. The mode of transportation constitutes a separate decision step after the destination is chosen. Air transport is indicated if clearly faster for delivering a life threat to definitive care than rapid evacuation by land. Aeromedical evacuation is not the most ideal choice for the transport based solely upon the presence of mechanistic criteria. Indeed, stable patients who are assigned to a trauma center due to "mechanism" alone may be candidates for ground transport. Since timely delivery to definitive care is a tenant of current trauma systems, each end user of aviation services should understand and factor in delays in helicopter activation and utilization. Examples of well-known time intervals include:

- Launch time
- In flight time (time en route)
- Ground travel to a remote landing zone
- Reassessment and packaging of patient by air medical crew

Cumulatively, these may exceed driving times. Some local studies show that 45 to 50 miles can be covered more quickly by land. Local data from this author's system show that average scene times for patients awaiting the helicopter are in the range of 35 to 39 minutes.

If helicopters are to facilitate arrival at definitive care, early activation via simultaneous dispatch may be helpful in shaving off several of the delay time intervals. Knowing the above, ground crews should not prolong scene times unnecessarily to await aviation assets. Providers should be conscious of scene time as the event progresses. Consequently, liberal cancellation of aircraft is a consideration if re-assessment yields that greater progress can be made by proceeding by land rather than waiting. Continuity of care by the first arriving crew is more ideal than a hand-off unless the turnover provides specific additional clinical benefit, as delays and medical errors are heightened by hand offs.

CONCLUSION: AVOIDING PITFALLS IN WAITING FOR AIR MEDICAL RESOURCES

In conclusion, utilizing helicopters as a means of evacuation should never be a reflex reaction, but a separate calculation of benefit. Helicopter utilization may prolong on-scene times. In addition, HEMS activation carries

a small but distinct risk of crashes. Providers should not fail to calculate known delays beyond only the estimated time of arrival (ETA) and not make the assumption that the ETA of the aircraft is the time it will depart the scene. If providers consider the above, they will appreciate when the aircraft does not represent an additional time savings. Getting a less critical patient by air to a center a few minutes earlier is a failure to maximize a clinical benefit. Allowing a single variable to dictate the reason for air asset use is also a potential error. Avoiding a drive due to rush hour, or the EMS system's convenience (in order to get back to service more quickly) is not necessarily of clinical benefit to patients, and in fact might deplete the air asset availability for a more appropriate patient. Finally, failure to cancel the activation upon re-assessment when benefit is less clear-cut and the asset is still en route might still waste time unnecessarily. Fire, rescue, and EMS departments "turn around" rescue squads, extra engines, and paramedics on a daily basis. The argument that providers might just as well "keep them coming because they are in the air" fails to acknowledge the complexities inherent in such a decision. Assignment to aeromedical transport, similar to any other treatment intervention, carries with it a list of associated risks and benefits.

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DON'T FORGET TO KEEP AN OPEN MIND WITH EACH NEW CALL

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Although generally very skilled, EMS providers both develop skills and use experience that enhances their future performance. That very same practice experience can be a double-edged sword. How many times has the station discussion involved speaking of the "BS" calls they run daily? Depending on multiple factors, human and otherwise, a given provider may be lulled into a false sense of security or complacency about the encounter in real time or in advance. This is the classic potential customer relations mishap caused by letting one's guard down.

PATIENT POPULATIONS AT RISK OF A VIGILANCE LAPSE

Classic areas of potential conflict occur in similar patient populations that may often fool the emergency physician and the emergency medical technician alike:

- **Inebriates:** The consumption of alcohol not only hampers the judgment of patients with respect of refusing care, but is fraught with occult (hidden) pathology or diagnoses. In addition, these patients often have very concerned—but under-resourced—family members who maximize efforts to advocate for their loved one before a 911 call represents a crisis they cannot handle. On EMS arrival, the last frustration expected by family is one coming from their dealings with the crew.
- **Inmates:** This population represents a heterogeneous group of patients that are tempting for some to dismiss, both for skepticism associated with criminal culture and perhaps our own personal biases. Inmates however also have tricky occult conditions, and even do not divulge traumatic mechanisms, leaving them with similar medical needs as any other sick patient. Avoidance of bias is difficult, and it is imperative for providers to conduct a thorough patient history and examination.
- **Psychiatric patients** may have by definition a condition challenging their interaction with the environment around them; that fact makes differentiating between functional and organic illness very difficult to impossible in a single EMS encounter. Moreover, advocates for mental health are frequently present as the internal customers for allied health care providers. Consider the observations of mental health professionals

(social workers, case workers, caretakers) throughout the processes of patient assessment, treatment, and transport.

- **Frequent flyers:** Patients who rely on EMS more than average, many not close to being amongst the true 911 system abusers, will often have multiple episodes yearly of a non-life-threatening condition; the possibility of an exacerbation of truly critical illness still exists. It is usually more effective to deal with the challenging issues of system misuse when not actively engaged in incident response. Discussing these patients with a departmental quality assurance or community outreach officer helps reduce distraction and ensures adequate follow up of concerns.

CUSTOMER RELATIONS PRINCIPLES: AVOID THE PITFALLS OF A CLOSED MIND

Firstly, failure to keep a general open mind with each new call is the set-up for occasional but recurrent customer relations disasters. All events have a risk of their own. Specifically, the common sub-theme is judging the validity of a new call based upon previous EMS utilization, when in fact the "not so frequent flyer" may still be sick. Next, failing to mitigate judgmental tones in the presence of family or advocates jeopardizes subsequent trust and encourages confrontation. In fact, EMS crews should look to all persons as resources for extenuating history and coax the patient to cooperate and submit to care. Enlisting patient family members as allies helps alleviate tensions during a difficult patient encounter.

In a related twist on a theme, allowing less relevant issues to play a role in the medical assessment, such as lamenting the time of a call, pre-judging a neighborhood, or even getting caught up in a patient's sub-optimal personality serves as a "trap" for well-intentioned providers. Deploying a "distraction filter" is a way to ensure that the focus of any response remains on the delivery of excellent, high-quality patient care.

Underestimating the severity of a complaint by or about an inebriate or chalking any mental status change as being due to drinking, as well as dismissing the incarcerated patient or arrestee because of any of the above lapses have similar risks as Russian roulette applied to EMS. The resultant bullet in the chamber equates to a complaint against providers. Chalking up all symptoms of a mental patient to a psychiatric process, cutting corners in the physical assessment of a psychiatric patient, or dismissal of symptoms given by advocates is frustrating at best, or offensive at worst. Keep in mind the sensitivity associated with mental illness: It becomes painful or infuriating for patients when somatic complaints are automatically brushed off as being "all in your head." The medic who is sucked into this stereotype should be warned that the failure is not only a customer service failure, but

might represent a huge medical error. The opposite strategy, one of additional empathy and insight, is the guiding principle for the short time EMS has to be engaged with patients.

Clearly, the reality of our every day practice in EMS mirrors that of the emergency physician and nurse. It is well known in the risk management and error literature that the types of patients or situations addressed in this chapter pose a huge challenge to our vigilance and need for rapid assessments and decisions. The avoidance of problems is predicated upon maintaining excellent communication skills and exercising sound clinical judgment. The pitfalls of succumbing to a weakened sense of readiness are self-evident, and part of the solution starts with an open mind on every call.

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DON'T FAIL TO MANAGE THE DIFFICULT, BUT STILL MANAGEABLE CONSUMER

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Earlier in the section and elsewhere in this text, we spoke of the concept of patients and their advocates utilizing our services as customers. Using the analogy of any organization providing services or selling goods, there are always those more difficult to satisfy, or with lower thresholds to be critical of our efforts. By the same token, good agencies train a workforce that makes dealing with these customers a part of their skill set. Although we would all agree that extremely rude, abusive, or violent behaviors by patients towards EMS is completely intolerable and our safety is paramount, the majority of "difficult" patients are still manageable using our best human relation skills.

TYPES OF DIFFICULT CUSTOMERS

Common situations serve to exemplify difficult encounters. Accordingly, certain patients can exhibit frustrating behavior. The following scenarios may result in challenging encounters for EMS personnel:

- 1) Providers greeted with initial hostility from callers/patients
- 2) Being immediately questioned about "why it took you so long to arrive"
- 3) Having actions questioned or critiqued in the setting of what a previous provider did for the patient, or being berated by a layperson's expectations of what care should be given
- 4) The immediate or unreasonable demand to be transported to a more remote ED or facility
- 5) The patient calling for an ambulance with a very benign medical concern, or malingerer
- 6) The patient with sub-acute complaint waiting until overnight shift to call for help; this occurrence, however frustrating to EMS, might be viewed differently from a patient's perspective.
- 7) A patient selectively refusing parts of our proposed therapy we think are important
- 8) A patient posturing to refuse transportation even with a life-threatening condition
- 9) A patient who is a very poor historian and lives alone, with either sporadic or overbearing family support
- 10) An out of town advocate or family member making requests from a remote location that differ from a patient's desires or refusal of care (usually the elderly or family conflict)

CUSTOMER RELATIONS: COMMON PITFALLS IN MANAGING DIFFICULT PATIENTS

In the face of starting on the wrong foot with a patient, losing our cool is not a viable option in salvaging the recovery of the call. It is a relative failure to not de-escalate tensions in the early stages. Meeting belligerence with more belligerence only accomplishes the opposite; unless the degree of hostility by the customer amounts to an unmanageable or unsafe situation, it is often more constructive to meet belligerence with kindness. Another solution is letting a partner try a different approach.

If at all possible one should not fail to initially use benign apologetic skills to address circumstances beyond one's control, such as mechanical issues or traffic. Appearing to make excuses for actions or results within our control often backfires. A common distraction is letting irrelevant factors dictate our posture or demeanor with given patients. Poor attitude during a "middle of the night" call for a possibly not so serious complaint or judgmental behavior about previous EMS utilization might be at best not helpful, but at worst, prejudicial. Imagine the call from a citizen's perspective. Clearly, a tax paying, law abiding, and non-system-abusing citizen has the right to expect professional and courteous emergency care—at anytime. Frustration during early morning hours is a natural and understandable coping mechanism. However, it is best to re-redirect one's own and the patient's thoughts to the medical issue at hand.

Before failing to honor a reasonable request for an alternative destination to a closest hospital, the provider should understand the degrees to which patients frequently have reasonable rationales. These may include doctors and records of all care there, anxiety of a transfer, or complications from specialized procedure done there before. It is not worth a fight to protect an over-rigid interpretation of closest hospital.

If a conversation starts suggesting patients be transported in a private car or cab, each provider should stop to pause. Judging a social situation and declaring a disapproval that there is a car outside and it was not being used instead of the ambulance, or actually being on record as helping a patient into a car for someone else to drive to the ED is at very high risk for either medical or public relations sequelae.

Enlisting the patient's family in advocating the very best disposition for patients is often underutilized. The family's concern is actually a tool to get patients to accept services. Dismissing the input of the third party caller who knows the patient ("Dad is not acting right!") or failing to let a third party caller/family know about efforts to get the patient to submit, may not only be an opportunity lost, but may catch family off guard so that they cannot make arrangements to attend to the patient at home.

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DON'T LEAVE HIGH RISK CHIEF COMPLAINTS ON THE SCENE

ROGER M. STONE, MD, MS

Individual cases cross the desks of the Quality Assurance Offices in EMS systems every day. Most of the time, education is the solution to avoiding the pitfall of underestimating medical problems. One essential skill of an EMS provider, especially at the ALS level, is to recognize a high risk chief complaint. While we are able to spot a sick patient from across the room, we may be victims of "tunnel vision" with respect to how a patient looks in real time, without the perspective of the natural history of a complaint. Medics may first infer, and then give a patient a sense of security based on the present. The posture of the provider can easily trickle down to the patient or a lesser trained emergency medical service professional. Risky situations include those where patients are "talked out" of going to the hospital or downgraded by ALS personnel to BLS for transport.

RECOGNIZING HIGH RISK CHIEF COMPLAINTS

Our jobs as astute medics involve much more than the correct application of protocols and performance of skills. Providers sort through complex medical decisions and cultivate a sense of hindsight and foresight on the basis of our didactic funds of knowledge. Recognition of **high risk complaints** and our limitations in detection or diagnosis are essential. These complaints are those that point to dysfunction in a major organ system or its blood/nerve supply:

- **Breathing trouble** can be progressive, or fluctuating.
- An **altered mental status** has a HUGE differential diagnosis, and represents a stress or damage to the brain or its blood supply.
- **Syncope** (transient loss of consciousness) implies an interruption of blood supply to the brain. Concerning causes for a syncopal episode include structural heart disorders, dysrhythmias, and neurologic abnormalities.
- **Chest pain** not only represents high risk if cardiac, but other causes can be fatal as well, such as pulmonary embolism and aortic dissection.
- **Focal neurological signs** (weakness on one side, spinal sensory deficit) imply either peripheral or central nervous system damage or interruption.
- **Back pain or abdominal pain:** Back pain can represent something as serious as a spinal epidural abscess or as common as a musculoskeletal strain. These complaints mandate careful and thorough evaluation.

- Fever in the elderly and children.
- Seizure can also reflect injury or insult to the central nervous system.

GUIDING PRINCIPLES IN RESPONDING TO COMPLAINTS

High risk chief complaints demand a cautious approach. Advising patients to seek evaluation and treatment at a healthcare facility is always consistent with sound medical advice. Dismissing the timeframe leading up to the 911 call itself, in favor of focusing only on the conditions on scene, might ruin the opportunity to appreciate the natural history of complaints. Good faith third party input into the call, such as family calling in because they are worried, or bystanders, should be taken into consideration. Providers should take a positive approach to the value of a hospital evaluation and stress the emergency department's ability to accurately rule out a life threatening diagnosis. Any activity that can be perceived as "milking" or "coaxing" a patient refusal cannot be tolerated.

COMMON PITFALLS IN MANAGEMENT OF THE HIGH RISK CHIEF COMPLAINT

Failure to encourage patients with high risk complaints to seek treatment or transport is not putting forth our best efforts. Opening the encounter with something like "Do you want to go to the hospital?" is projecting a medical decision on the layperson, as though being evaluated might be medically elective. Only casually offering to take high risk patients to an ED may falsely give patients the impression that they were screened by a medical authority and might be safe to delay or seek follow-up attention electively. Downplaying the value of an ED visit or emphasizing negative aspects of the visit such as long wait times will discourage compliance, and might even be argued as coercing an EMS refusal of care.

Failure to capture the information prior to the 911 activation as part of the history or failure to listen to information provided by family or bystanders—including callers from remote locations—may miss details that indicate high risk in the first place. Dismissal of information is frustrating to customers who wanted its consideration, but underestimating their concerns becomes infuriating when the outcomes are sub-optimal.

Once discussion of a refusal takes place, suggesting a patient proceed to a hospital by car and/or helping a patient into the car does not necessarily get the crew off the hook.

Pinning any refusal on the patient using their signature has limitations. Patients, family, and their attorneys retroactively will blame the refusal on any provider failing to (1) outline the foreseeable risks and (2) provide an informed decision.

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AVOID ENGAGING IN CONFLICT WHEN RESPONDING TO HEALTH CARE FACILITIES

ROGER M. STONE, MD, MS

A significant portion of our EMS business, although not the majority, includes responses to health care facilities (HCFs) such as doctor's offices and nursing homes. It is beyond the scope of this text to describe the shortfalls in the ability of these facilities to handle minor emergencies or mitigate the moderate to severe illness or injury. However, suffice it to say there is a variable level of enhanced medical triage and diagnosis that may take place before the decision about EMS activation, which ideally skilled facilities are expected to provide, while the lay public does not. EMS providers need to be able to use any medical information by non-laypersons as an ally in care, and yet keep a healthy perspective on the limitations of nursing facilities, doctor's offices, and outpatient centers. Built-up frustrations or acute lack of mutual understanding of each other's vocations has created a set-up for customer relation mishaps if not mitigated by training, sensitivity, and complaint avoidance strategies.

DEPTH OF ISSUES AND CHALLENGES IN HEALTH CARE FACILITY RESPONSES

The interaction between an HCF and the EMS system is exceedingly complex. Developing an effective response strategy begins with an understanding of some unique challenges to emergency care:

- The sheer numbers of patients in skilled nursing or assisted living facilities are daunting.
- A high acuity population in HCFs provides a broad, acute, and chronic pool of pathology.
- Variable levels of training in handling emergencies exist amongst the staff.
- Tremendous turnover and skeleton nursing staffs makes education about EMS difficult.
- Lack of knowledge by given shift workers on the status of many patients at any given time.
- Nursing home over-utilization of 911, based upon delayed responses by non-emergent commercial transportation, inability to handle problems internally, or misunderstanding by doctors about the 911 system when they order transportation to ED over the phone.
- Nursing facilities fear any pathology worsening or mortality occurring on their property.

- Doctor's office or surgery centers are not geared towards handling urgencies.
- Physicians may display a lack of respect for, or knowledge of the capabilities of, EMS.
- Staff may not show up at the bedside to greet EMS, in favor of attending other patients.
- The code status or advanced directives of patients are not well known by staff.

PITFALLS IN HEALTH CARE FACILITIES RESPONSE

Despite challenges described above, displaying poor will in a Doctor's Office, Urgent Care, or Skilled Nursing Facility is fraught with pitfalls and helps no one. Failure to practice restraint on a given call in light of previous problems with over-utilization, or starting debates with nurses and doctors about patients' dispositions or mode of transport may only distract the provider from medical vigilance and cause the dismissal of a sign or symptom. Failure to keep disagreements with medical staff away from patients or their families, or allowing attitudinal, emotional or judgmental overtones to be picked up by customers is merely an invitation for complaints, or worse yet lawsuits if there are bad outcomes. If there is a disagreement, the inappropriate documentation of irrelevant factors or implicating guilt in the medical record (engaging in "chart wars"), instead of filing a confidential quality assurance incident report is another recipe for legal peril that sucks in rather than exonerates the provider.

Whenever possible, EMS providers should view physicians or other HCF staff as allies in the delivery of emergency health care. The general tone of all encounters should start out as attentive and welcoming of input, even if the medic is the better person. Dismissing physicians' working diagnosis or failing to offer a collaborative approach with the physician, with an explanation of EMS protocol, might create rather than avert a misunderstanding, and thus undermine smooth handoffs and continuity of care.

After all the justified frustrations EMS providers may have about HCFs in certain encounters, some fail to constructively engage the quality leadership in writing at a later date when input about system issues may actually lead to quality improvement for future calls. This is ironically a pitfall after the fact, when venting those frustrations is actually appropriate.

BEST PRACTICES

Responding to HCFs is a daily routine and presents unique challenges for the EMS responder. On the one hand, many of these facilities might be expected to have better capabilities to care or provide first response for, or information about, patients they serve. On the other hand, many are

less familiar with triaging patients in need of acute care, or discriminating between the types of prehospital services most appropriate to move patients given their complaint. Consummate professionals should use all medical information from facilities to their and the patients' benefit, avoid conflict about 911 utilization in real time, be poised to use physicians and nurses as allies, and address system issues later in a constructive manner.

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DON'T FAIL TO CONSIDER THE FAMILY

JEFF BEESON, DO, EMTP

"Medic 70, respond code 3 to 100 Main Street for a 60-year-old male in cardiac arrest." You begin to run the possible causes in your mind. Is it a coronary occlusion, is there an underlying cardiac condition, is there some reversible cause I can identify? You pull out of the station clearing traffic to the left. Main Street is just a few miles from the station. The controller advises CPR is in progress by a family member. The crew discusses the role each will provide upon arrival. What equipment are we going to take in with us? As you approach the address, the house is dark, and no excitement is visible.

You arrive on the porch and open the door. Your partner loudly announces EMS is here. You hear an excited middle-aged women yelling, "We are in here!! PLEASE HURRY!!" You walk into the room to find a middle-aged man in his recliner. His wife is attempting to perform chest compressions while he is in the chair. Your partner rudely asks why she didn't get him onto the floor. With tears in her eyes she advises she was unable to move him to the ground, "I did the best that I could, I am so sorry!" she says.

As you move him to the ground and take over CPR, your partner attaches the cardiac monitor. "Asystole," he states. You both inquire to how long he has been like this. The wife says, through tears and sobbing, "He told me he wasn't feeling good after dinner and was going to sit in his chair to watch the news." She says, "I was washing the dishes, and I heard a weird sound coming from the room. I went in and found him foaming at the mouth, and he wouldn't respond to me so I called 911." Your partner asks if the man has any advanced directives. The wife is unsure what that means. He then asks if her husband ever told her what his wishes were about life support. She replies, "He has a will, and it says that if there was no chance of him waking up, he didn't want to be on a breathing machine or have a feeding tube." She is now distraught and crying loudly as you continue compressions and resuscitation.

Your partner then says, rather sharply, "We need to call our doctor because your husband doesn't want anything done, so we need orders." You feel uncomfortable with this but your partner has been doing this longer than you, so you keep quiet. A minute later your partner returns to the room and says, "Dr. B at County Hospital gave us a termination order at 2145." The wife asks what that means, and your partner replies, "Your husband has died."

While you are picking up your equipment, the son arrives at the home and asks what is going on. Your partner advises him his father has died. The son screams at your partner, "WHY ARE YOU NOT DOING CPR ON HIM?!?!!" The son hurries past you and starts chest compressions on his father. Your partner goes over and wrestles the son to the floor. You get on the radio and state, "Medic 70 needs a police officer code 3 for a family member fighting with EMS!" Police arrive and the situation escalates. You get your equipment out of the house and return to the station. This call does not sit well with you. Your partner keeps stating, "How dare that man fight with me. We should have had him arrested for interfering with a medical examiner case!"

Customer service seems to be intuitive in EMS. It is not all that difficult to treat people the way you want to be treated. But is it? We all have been part of similar cases to the one above. Statistics on survival from cardiac arrest are not great. Many groups have been studying this for years and no one magic bullet has been found. So why do we not give everyone the same chance? Why does a 60-year-old man who was witnessed by a family member, with bystander CPR in process, only get a termination order, when a 1-month-old child last seen hours ago who is cold with rigor mortis gets a full resuscitation with transport to the hospital? Who are we to remove loved ones from the room where we are attempting to resuscitate their family member? After all, they have known each other for years, and we have known them for only a few minutes.

Many studies have shown that family presence during resuscitation improves satisfaction. When family members witness a crew of individuals—working feverishly on their loved one—they often ask if efforts to resuscitate can be stopped. Many providers feel, however, that there is some liability risk if family members are present, that they may not understand what is being done, and that when or if their loved one dies, they will sue us. There is no evidence to support this, even though stories exist. It is simple: Resuscitation should be very fluid and practiced. It should look like a smooth pit stop at a NASCAR race with the handling of all four tires and a tank of gas. It should not look like a bunch of keystone cops running around the car looking for the door. The pitfall for the EMS provider here is not being practiced and prepared.

The focus should be to first ensure that a resuscitation appropriate for the clinical situation is being performed. We should then turn to the family: Bring them in the room. Explain everything that is going on, even what the monitor is showing and what that means. An experienced provider can tell if a family member is not going to maintain composure before being taken in to the resuscitation area. If the provider has any question, the family members should be asked if they would prefer someone else to go instead.

Communication is the key. From the initial 911 call to the transport, we should explain everything, and the pitfall is in not doing so. We set the tone for everything we do. Providing good customer service is the same as being a patient advocate, and the pitfall is in failing to do so. No matter what type of call you are on from the worst trauma you have seen to the sore throat, patients are persons, and we should treat them and their family with the utmost respect. Do unto others as you would have them do unto you.

Medicine is a science, but dealing with patients and their families is an art. Some artists are born with talent, but they still must practice to improve their skills. We must do the same. We must take each situation and improve upon it. We would never allow a paramedic to treat our family like the lead provider in the beginning of this chapter. We must not allow it to happen to anyone.

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DON'T MISS THE DIAGNOSIS OF EXCITED DELIRIUM

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Excited delirium is a temporary disturbance in consciousness and cognition, patients are disoriented, have very disorganized and inconsistent thought processes, are unable to distinguish reality from hallucinations, have disturbances in speech, and are combative or violent. The typical patient with excited delirium is often aggressive and agitated, confrontational, and misdiagnosed. They present tremendous challenges to law enforcement and EMS providers. The rapid changes in mental status seen in patients with excited delirium are frequently thought to be due to drug ingestion, alcohol, head injury, hypoglycemia, or psychiatric illness. In addition, these patients often seem to be impervious to pain, and are usually hyperthermic, and tachycardic. Due to their uncontrolled behavior, excited delirium patients are often the victims of law enforcement efforts to control their behavior with physical attempts to subdue them. The use of TASERs is common in this group of patients, and EMS providers must be cognizant of the consequences of an aggressive response by law enforcement.

The greatest pitfall pertaining to caring for the patient with excited delirium is failure to consider the diagnosis and rule out other underlying causes of delirium and agitation such as hypoxia, hypoglycemia, and trauma. Starting with behavior reported in 9-1-1 calls, an American College of Emergency Physicians (ACEP) task force said Prehospital Excited Delirium Syndrome should be presumed, if a patient is disoriented or not making sense, constantly physically active, impervious to pain, has superhuman strength, is sweating and breathing rapidly, has tactile hyperthermia, and fails to respond to a police presence. Attempts to gain insight into possible other causes, such as a history of hypoglycemia, can be obtained from callers, bystanders, or family members at the scene. Obvious signs of trauma or head injury may be visible from a safe distance, and EMS providers can also assess the scene for indications of alcohol or substance abuse, or other clues to alternate diagnoses.

Another pitfall in the care of patients with excited delirium is the lack of recognition of the serious, and potentially lethal, nature of the syndrome. Excited delirium is a medical entity, not solely a law enforcement issue, and providers must resist the temptation to just have these patients restrained and arrested. Potential complications of excited delirium include

hyperthermia, hypovolemia, acidosis, rhabdomyolysis, and hyperkalemia. EMS agencies should have protocols for aggressively treating patients with excited delirium. The ACEP task force recommends immediate medical assessment and treatment once physical control is obtained. "Initial assessment should include . . . vital signs, cardiac monitoring, IV access, glucose measurement, pulse oximetry, supplement oxygen, and careful physical examination," the White Paper noted. Treatment should include rapid capture of the patient by law enforcement and administration of a sedative by EMS to calm the patient and allow for treatment. Many services use a benzodiazepine such as Versed via the needleless mucosal atomizer device, which allows for drug delivery with minimal risk of accidental needlestick to EMS and rapid drug delivery to the patient. Once the patient is calm and accessible, an IV of cooled normal saline is initiated and rapidly infused. Some services administer a prophylactic 1 amp of sodium bicarbonate for possible acidosis that results from prolonged struggle. If possible, cardiac monitoring is crucial so that ECG changes consistent with hyperkalemia, such as peaked T waves and a widening QRS, can be rapidly recognized and appropriately treated. It is also important to recognize that patients with excited delirium are at risk for sudden death so patients who unexpectedly become "quiet" need immediate attention.

In summary, patients with excited delirium must be quickly recognized and aggressively treated. Chemical sedation is important, as is aggressive rehydration, cooling, correction of metabolic disturbances, prevention of self-harm, careful monitoring, and rapid response in the event of a catastrophic deterioration in the patient's condition.

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